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The Patent Office  
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Cardiff Road  
Newport  
South Wales  
NP10 8QQ

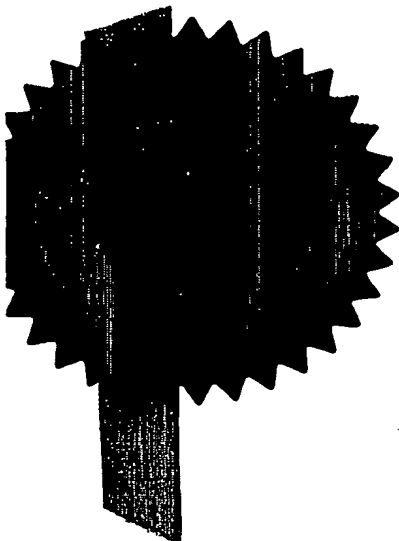
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**2. Patent Application Number**

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**3. Full name, address and postcode of the or of  
each applicant**MeadWestvaco Packaging Systems LLC  
One High Ridge Park  
Stamford  
Connecticut 06905  
United States of America

Patents ADP Number

If the applicant is a corporate body, give the  
country/state of its incorporation8569808001  
Delaware, USA**4. Title of the invention**

Carton and Carton Blank with Access Means

**5. Name of your agent**

Hepworth Lawrence Bryer &amp; Bizley

"Address for Service" in the United Kingdom  
to which all correspondence should be sentBloxam Court  
Corporation Street  
Rugby  
Warwickshire  
CV21 2DU

Patents ADP number

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Date 8 April 2004

*Hepworth Lawrence Bryer & Bizley*  
Hepworth Lawrence Bryer & Bizley

12. Name and daytime telephone number of person to contact in the United Kingdom.

John Hepworth  
01788 577000

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DUPLICATE

**CARTON AND CARTON BLANK WITH ACCESS MEANS**Background of the Invention

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The present invention relates to a carton for containing a plurality of similar articles, such as bottles and a means for retaining the bottles within the carton and in particular to a means of accessing the articles.

- 10 Cartons for encasing multiple articles are useful for enabling consumers to obtain and transport a desired quantity of individual articles such as soft drinks or other beverages. Such cartons need to be strong enough to support multiple articles, especially if the articles are bottles. It is also desirable for such cartons to be easy to handle and portable.

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- It often desirable for the articles contained within the carton to be displayed and also for the carton to have large areas which can be printed with advertising graphics. It is also often desirable for the articles to be easily accessible and it is also preferable for the articles to be secured in place
- 20 within the carton, especially if the articles are fragile, for example glass bottles. It is however undesirable for articles to be accessed too easily, for example, before being purchased.

- It is also desirable to have a carton which after the contents of the articles
- 25 have been consumed can be used to return the empty articles to a recycling point.

- The present invention seeks to provide a means for displaying the articles or a portion of the articles in combination with an access means for removal of the
- 30 articles where the access means leaves the carton with sufficient integrity for replacement of articles for the purpose of returning to a recycling point.



### Summary of the Invention

According to a first aspect of the invention, a top closure panel for closing the top of an open-topped container, the panel having at least one aperture, each to receive a portion of an article held within the container and including a tear feature for enlarging the size of the or each aperture, the tear feature comprising at least one discrete group of score lines, the score lines radiating from the aperture and being arranged substantially perpendicular to a notional radial line such that removal of an article through the aperture causes a tear to propagate divergently from the notional radial line thereby causing the size of the aperture to be progressively increased.

Preferably wherein the or each discrete group of score lines may comprise at least two score lines wherein the score line furthest from the aperture is longer than the score line closest to the aperture.

Preferably wherein the or each discrete group of concentric score lines may comprise five score lines arranged such that a score line closest to an aperture is in overlapping relation with at least two score lines further spaced from the aperture.

Preferably a termination of one score line is spaced between 1mm and 5mm from a termination of an adjacent score line.

Additionally the top closure panel may be prevented from being completely released from the open top container by a retaining means provided by the open top container.

Preferably the aperture may comprise an initiating nick disposed substantially on the notional radial line. The score lines may also be of substantially equal length.

Preferably the score lines furthest from the aperture may be larger than the score lines closest to the aperture

5 According to a second aspect of the Invention, a blank for forming a top closure panel for closing the top of an open-topped container, the panel having at least one aperture, each to receive a portion of an article held within the container when in use and including a tear feature for enlarging the size of the or each aperture, the tear feature comprising at least one discrete group of score lines, the score lines radiating from the aperture and being arranged substantially perpendicular to a notional radial line such that removal of an article through the aperture causes a tear to propagate divergently from the notional radial line thereby causing the size of the aperture to be progressively increased.

10  
15 Preferably the or each discrete group of score lines may comprise at least two score lines wherein the score line furthest from the aperture is longer than the score line closest to the aperture.

20 Additionally the tearing feature may further comprise an initiating means which extends normally from an edge of the aperture and towards the group of short slits.

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#### Brief Description of the Drawings

An exemplary embodiment of the Invention will now be described, by way of example only, with reference to the accompanying drawings in which;

30 Figure 1. shows a first part of a blank for forming a carton according to one embodiment of the Invention;

Figure 2. shows a second part of a blank for forming a carton according to one embodiment of the invention;



Figure 3. is a perspective view from the front, side and top of a carton constructed from the blanks of Figs. 1 and 2;

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#### Detailed Description of the Preferred Embodiments

Figs. 1 and 2, show first and second parts of a two-part blank for forming a carton 30, made from paperboard or similar foldable sheet material. It is envisaged that a unitary blank could be used instead, without departing from the scope of the invention. In the first embodiment of the invention two blanks 10 and 20, of Figs. 1 & 2 are formed into a tubular crate and a cover respectively. The cover is inserted into the tubular crate to form the carton 30 of the first embodiment, which is shown in Fig. ~~2~~ 3

It is envisaged that minor variations to the invention could be made for example a crash bottom of the type known in the art, could be employed without departing from the scope of the invention. The invention is designed to receive similar articles, such as bottles, but it is envisaged that the present invention could be used to contain other articles, without departing from the scope of the invention.

The blank 10 for forming the tubular crate is shown in Fig. 1. The blank 10 comprises first and second side panels, 12, 16, front and back panels 14, 18 and corner panels 90 hinged one to another in series along fold lines 42a, 42b, 44a, 44b, 46a, 46b, 48a and 48b respectively. A glue flap 88 is provided to secure the back panel 18 to the first side wall 12, in this embodiment a recess is provided toward the top end of the glue flap 88.

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Handle apertures 54 are struck from the first and second side walls 12, 16 and are provided with finger gripping tabs 58. The finger gripping tabs 58 protrude inward from the upper edges of the handle apertures 54. The finger gripping tabs enable the erected carton to be easily grasped and lifted by the



handle apertures 54. Top end flaps 76 are hinged to each of the front, back and corner panels 14, 18 and 90, to provide reinforcement of the top edges of the front, back and corner panels 14, 18 and 90, when the blank 10 is erected into a tubular crate.

5

Turning to the construction of the tubular crate from blank 10, a series of sequential folding and gluing operations are required, which preferably can be performed in a straight line machine, so that the crate and/or blank 10 are not required to be rotated or inverted to complete the construction. The folding process is not limited to that described below and can be altered according to particular manufacturing requirements.

The first stage is to apply glue to the outside edge of glue flap 88 and then fold it 180° about fold line 48 so that it lies in flat face contacting relation with the inside corner panel 90. The front panel 14 is then folded about fold line 44b so that it lies flat on top of the inside face of second side panel 16. This causes the first side panel 12 to come into flat face contacting relation with the back panel 18 and the glued outer edge of glue flap 88, so that the first side panel 12 becomes stuck to the glue flap 88, thus connecting the first side panel 12 and back panel 18. The blank 10 can then be erected into a tubular structure and using a similar series of folding and gluing steps, the bottom end flaps 72, 74 can be secured to form a bottom end closure means.

A second blank 20, shown in Figure 2, can be formed into a cover for the tubular crate formed from the blank 10 of Figure 1. The blank 20 comprises a main panel 22, which is, on either side, hinged to inner handle panels 24. Handle apertures 54 are struck from the inner handle panels 24 and finger gripping tabs 58 protrude inward from the upper edges of the handle apertures 54. The inner handle panels 24 are hinged to outer handle panels 26, which have finger gripping tabs 58 integrally formed at their edges. The outer handle panels 26 are recessed and formed such that they complement the shape of the handle apertures 54 struck from both the inner handle panels 24 and those struck from the front and back panels 14, 18. Cover end flaps 28



are hinged to the main panel 22 and can provide structural rigidity as well as aesthetic appeal to the carton 30, when assembled.

In this embodiment of the invention the main panel 22 is provided with twelve  
5 apertures 56, arranged in four rows of three, each for receiving a portion of a  
bottle. After loading the tubular crate with bottles the cover formed from blank  
20 is brought into registry with the bottle necks. Inner handle panels 24, cover  
end flaps 28 and tabs 92 can then be secured to inside faces of the first and  
second side panels, 12, 16, front and back panels 14, 18 and corner panels  
10 90 respectively. The outer handle panels 26 can be secured to outer faces of  
the first and second side walls 12, 16. In this way a three layer reinforced  
handle structure is formed in opposing ends of the carton 30, one of the layers  
being provided by the first and second side walls 12, 16 and two of the layers  
being provided by the inner and outer handle panels 24, 26.

15 The carton formed from the blanks 10 and 20 is shown in Figure 3. It can be  
seen that the bottles are secured within the carton, once the cover made from  
blank 20 has been secured inside the tubular crate. Access to the bottles is  
gained by separating the frangible connections or nicks 37, this may be  
20 achieved simply by pulling on a bottle contained within the carton 30. In this  
way each bottle can be accessed individually, whilst the structural integrity of  
the carton 30 is maintained. Bottles not removed are held in position by the  
apertures 56 in the cover. Therefore the carton provides an adaptable carrying  
container, the structural integrity of which is not destroyed when the bottles  
25 are accessed. This enables the carton to be reused for the convenient  
returning of the empty bottles.

In other embodiments of the invention the cover formed from blank 20 may  
not comprise inner and outer handle panels and may not be secured by glue  
30 to the tubular crate, formed from blank 10. The tubular crate may further  
comprise retaining tabs to prevent the cover from being completely removed  
from the carton upon removal of the articles. In this way the main panel 22  
may be flexible to accommodate removal of the articles. It is also envisaged  
that reinforcement of the handle apertures 54 could be provided by inner

handle panels 24 secured to the blank 10 for forming the tubular crate and not to the cover of blank 20.

Access to the bottles contained within the closed carton 30 can be achieved  
5 by pulling the bottles from the carton 30. The apertures 56 are sized to accommodate the neck of a bottle and removal of a bottle is achieved by enlarging the size of the apertures 56. This is achieved by tears which propagate between score lines or nicks 37, when the bottles are pulled through the aperture. The score lines or nicks 37 are arranged in discrete  
10 groups, each discrete group of score lines comprising a series of partial concentric score lines around the apertures 56, at least some of the score lines in different concentric locations being offset relative to those in other concentric locations. The diameter of each aperture 56 can be progressively expanded or the periphery of that aperture 56 displaced out of the normal  
15 plane of the main panel 22 in response to pulling the bottle neck through the aperture. Removal of a bottle is achieved without substantially rupturing the panel.

Score lines 37 following the notional line of one concentric ring may be offset  
20 from score lines 37 provided in a notional line of an adjacent concentric ring. The score lines 37, in this embodiment, are arranged in discrete groups of either three or five score lines 37 arranged in three substantially concentric rows. The terminations of the score lines 37 in one row may be offset from the terminations of the score lines 37 of an adjacent row. In this embodiment of  
25 the invention each aperture 58 also comprises an initiating nick which extends, from the edge of the aperture 56, towards each group of score lines or nicks 37.

Sufficient separation of the weakened connections can be achieved by pulling  
30 a bottle from the carton 30. In this embodiment of the invention, as a bottle is pulled from the carton 30, diverging tears propagate from each initiating nick and can follow paths which are defined by the terminations of each partially concentric score line 37. In this embodiment of the invention two tears may diverge from each initiating nick which extends towards a group of five score



- lines 37. The two tears are guided from the initiating nick to the score line 37 closest to the aperture 56 and propagate from the terminations of the closest score line 37 to offset terminations of the next adjacent outer score line 37. The tears link the termination points of one score line 37 to the next, propagating out from the aperture to an extent defined by the outermost score line 37 of a group. In this way the size of an aperture 56 can be progressively increased by the propagation of the tear which continues until the bottle is removed.
- 10 The nicks 37 of the outermost notional concentric ring may define the maximum enlargeable size of the aperture 56, this may be designed to be sufficiently large to allow a bottle to be withdrawn from the carton 30. Removal of bottles from adjacent apertures may cause the tears propagating from one of the apertures to intersect tears propagating from one of the adjacent
- 15 apertures. This may cause material to be removed from the top panel once a few bottles have been removed, however it is envisaged that the apertures and nicks 37 could be arranged and sized such that the tears of adjacent apertures do not intersect and hence the top panel 22 remains substantially integral once the bottles have been removed.
- 20 In an other embodiment of the present invention each discrete group of score lines may comprise only two score lines 37 arranged in overlapping relation wherein the score line furthest from the aperture is longer than the score line closest to the aperture. The two score lines 37 may be positioned such that a pair of their terminations lies on a notional radial line extending from the
- 25 aperture or they may be positioned such that a pair of their terminations lies on a notional tangential line extending from the aperture. I.e. at least at one end of the score lines 37 the terminations are staggered and a tear can propagate between the staggered ends.
- 30 It can be appreciated that various changes may be made within the scope of the present invention, for example, the size and shape of the panels and apertures may be adjusted to accommodate articles of differing size or shape. In other embodiments of the invention it is envisaged that the apertures

formed within the top panel may not be perfectly circular and may also be provided with additional tabs protruding into the aperture, to aid retention of the bottle necks or other articles contained within the carton. It is also envisaged that each group of nicks 37 could comprise more or less than five nicks. If for example articles shaped with very narrow necks and larger bottoms are to be held within the carton, it is envisaged that seven nicks could make up each group, the nicks may be arranged in four offset-rows and the diameter of the extended aperture, after the articles are removed, would be substantially larger than the original aperture 58.

10

It will be recognised that as used herein, directional references such as "top", "bottom", "front", "back", "end", "side", "inner", "outer", "upper" and "lower" do not limit the respective panels to such orientation, but merely serve to distinguish these panels from one another. Any reference to hinged connection should not be construed as necessarily referring to a single fold line only; indeed it is envisaged that hinged connection can be formed from one or more of the following, a score line, a frangible line or a fold line without departing from the scope of the invention.

15

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Claims

1. A top closure panel for closing the top of an open-topped container, the panel having at least one aperture, each to receive a portion of an article held within the container and including a tear feature for enlarging the size of the or each aperture, the tear feature comprising at least one discrete group of score lines, the score lines radiating from the aperture and being arranged substantially perpendicular to a notional radial line such that removal of an article through the aperture causes a tear to propagate divergently from the notional radial line thereby causing the size of the aperture to be progressively increased.
2. A top closure panel according to claim 1 wherein the or each discrete group of score lines comprises at least two score lines wherein the score line furthest from the aperture is longer than the score line closest to the aperture.
3. A top closure panel according to any preceding claim wherein the or each discrete group of concentric score lines comprises five score lines arranged such that a score line closest to an aperture is in overlapping relation with at least two score lines further spaced from the aperture.
4. A top closure panel according to any preceding claim wherein a termination of one score line is spaced between 1mm and 5mm from a termination of an adjacent score line.
5. A top closure panel according to any preceding claim wherein the top closure panel is prevented from being completely released from the open top container by a retaining means provided by the open top container.
6. A top closure panel according to any preceding claim wherein the aperture comprises an initiating nick disposed substantially on the notional radial line.

7. A top closure panel according to any preceding claim wherein the score lines are of substantially equal length.
8. A top closure panel according to claim 7 wherein the score lines  
5 furthest from the aperture are larger than the score lines closest to the aperture
9. A blank for forming a top closure panel for closing the top of an open-topped container, the panel having at least one aperture, each to  
10 receive a portion of an article held within the container when in use and including a tear feature for enlarging the size of the or each aperture, the tear feature comprising at least one discrete group of score lines, the score lines radiating from the aperture and being arranged substantially perpendicular to a notional radial line such that removal of  
15 an article through the aperture causes a tear to propagate divergently from the notional radial line thereby causing the size of the aperture to be progressively increased.
10. A blank for forming a top closure panel according to claim 9 wherein  
20 the or each discrete group of score lines comprises at least two score lines wherein the score line furthest from the aperture is longer than the score line closest to the aperture.
11. A blank according to either of claims 9 or 10 wherein the tearing feature  
25 further comprises an initiating means which extends normally from an edge of the aperture and towards the group of short slits.
12. A blank for forming a top closure panel according to any of claims 1 to  
30 8.

ABSTRACT

5 A carton for containing bottles, the carton having a top closure, the top  
closure having a plurality of apertures each to receive a bottle neck, each  
aperture having a tearing feature which comprises at least one group of  
short slits, the short slits being offset from one another and arranged such  
that removal of the bottles causes the tearing feature to separate and each  
aperture to be enlarged.

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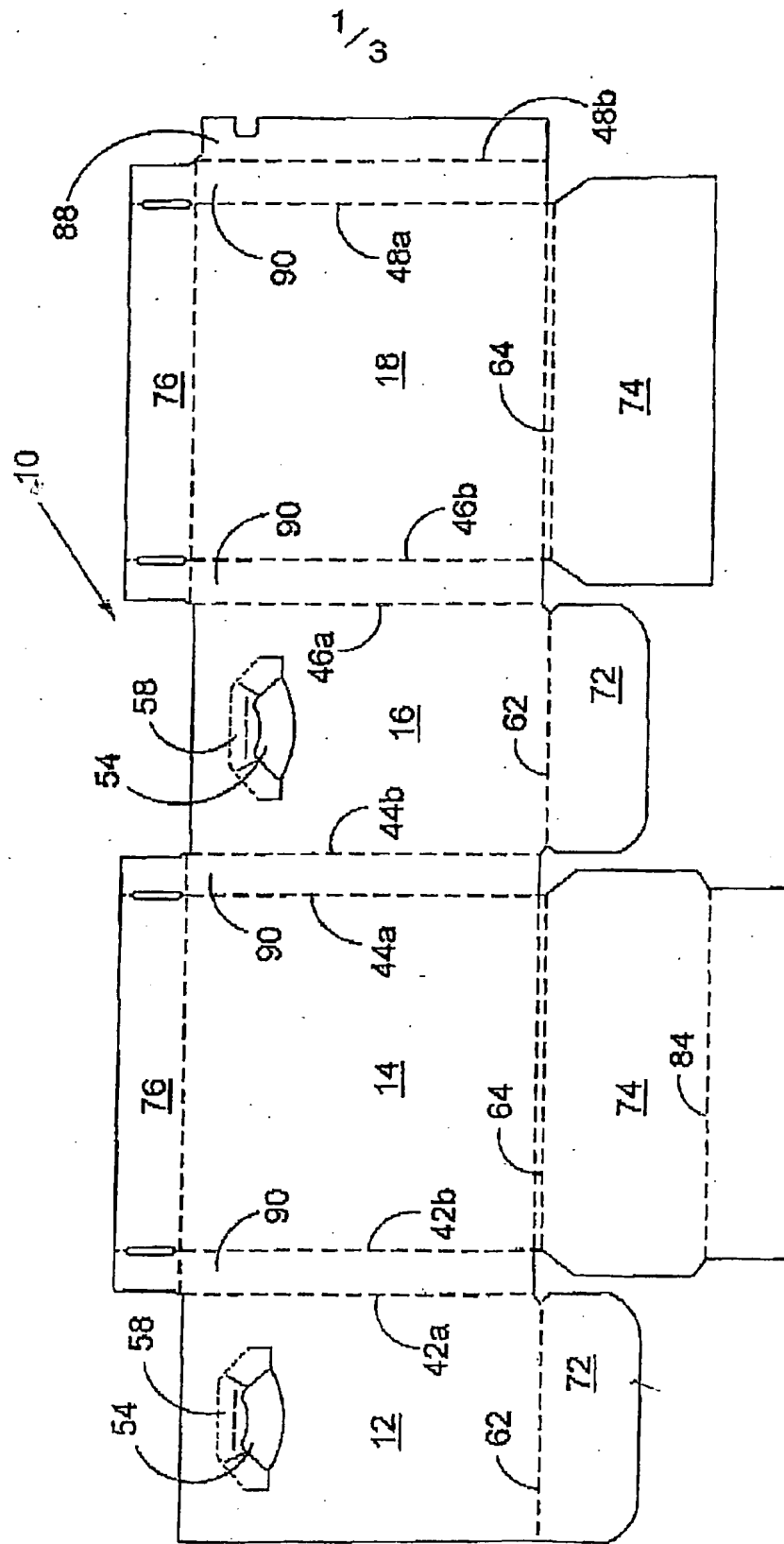
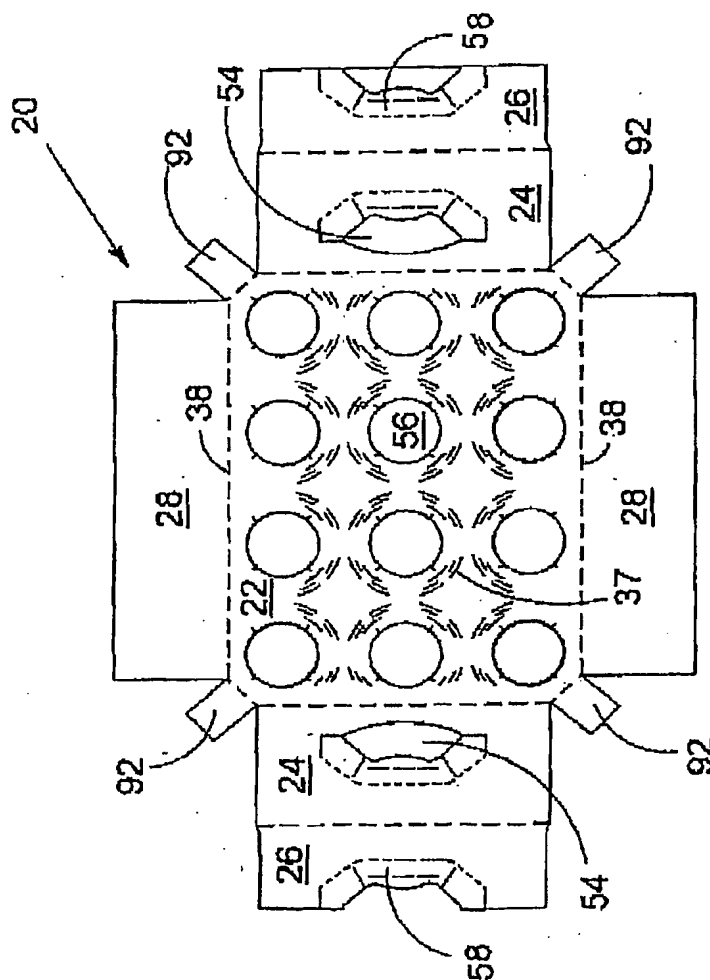


FIGURE 1

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3/3

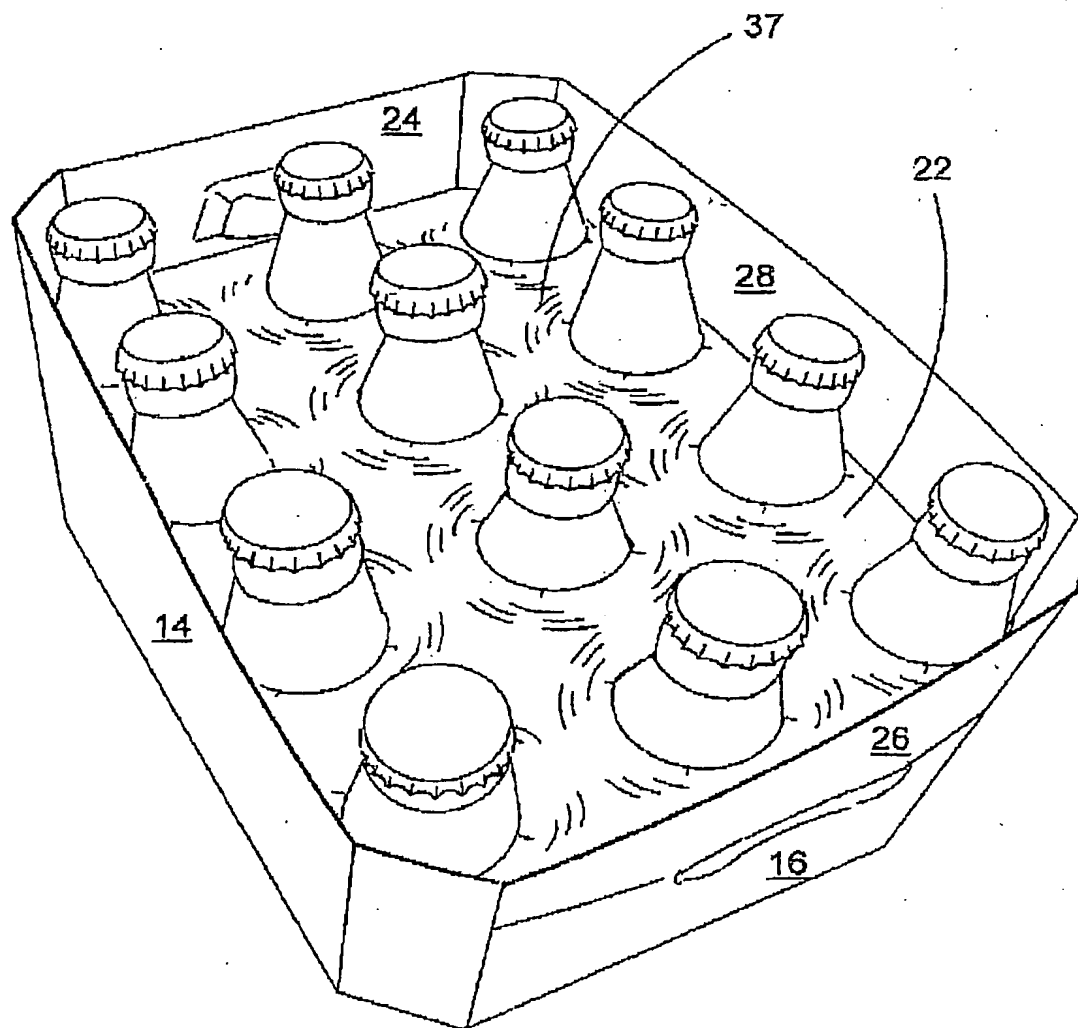


FIGURE 3